

WHAT IS CLAIMED IS:

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1. A portable vibration monitor, comprising:
  - a housing;
  - a probe;
  - 5 a transducer coupled to said probe, wherein said transducer is substantially enclosed within said housing, and wherein said transducer has as an output an analog signal representative of vibrations present in a piece of vibrating machinery contacted by said first portion of said probe;
  - an analog to digital converter coupled to said output of said transducer,
  - 10 and configured to digitize said analog signal;
  - a processing circuit configured to receive said digitized analog signal and to produce digital data comprising at least one vibration parameter derived from said digitized analog signal, and
  - an interface circuit configured to receive said digital data from said
  - 15 processing circuit and to transmit said digital data to a device external to said housing while said processing circuit is producing additional digital data for transmission.
2. The monitor of Claim 1, wherein said at least one vibration parameter comprises velocity.
- 20 3. The monitor of Claim 1, wherein said at least one vibration parameter comprises enveloped acceleration.
4. The monitor of Claim 1, wherein said at least one vibration parameter comprises a value indicative of the degree of bearing wear.
5. The monitor of Claim 1, wherein said vibration parameter comprises a
- 25 frequency domain spectrum.
6. A method of monitoring the condition of a machine, comprising the steps of:
  - mechanically coupling a transducer to a measuring point on a machine;
  - processing an output of said transducer to produce data indicative of
  - 30 one or more characteristics of vibrations of said machine; and

storing said data in a memory located proximate to said measuring point  
on the machine.

7. The method of Claim 6, additionally comprising the step of  
subsequently retrieving said data from said memory.

8. The method of Claim 6, additionally comprising the step of storing data  
indicative of the date said vibration characteristics data of said machine was acquired.

9. The method of Claim 6, additionally comprising the step of storing data  
indicative of bearing service history or bearing assembly.

10. A method of monitoring the condition of a machine, the method  
comprising the steps of:

contacting a measuring point on said machine with a portable probe  
comprising a vibration transducer;

converting an output of said transducer to first data indicative of one or  
more characteristics of vibrations of said machine;

date stamping said first data;

storing said date stamped first data in a memory located proximate to  
said measuring point on said machine;

contacting said measuring point a second time with a portable probe  
comprising a vibration transducer;

converting an output of said transducer to second data indicative of one  
or more characteristics of vibrations of said machine at said second time;

date stamping said second data;

storing said date stamped second data in a memory, said memory being  
located proximate to said measuring point; and

retrieving said date stamped first data and said date stamped second  
data from said memory.

11. The method of Claim 10, wherein said step of retrieving said data  
comprises the step of contacting said measuring point a third time with a portable  
probe comprising a vibration transducer.

12. The method of Claim 10, additionally comprising the step of evaluating  
a trend in said retrieved date stamped data.

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✓ 13. A vibration monitoring probe for monitoring the condition of bearings in rotating machinery, said vibration monitoring probe comprising:

a housing;

5 an electrical interface comprising two or more conductive contacts on a surface of said housing for transmitting and receiving digital data from a measuring point on said rotating machinery;

an input/output port on said housing which is separate from said electrical interface and which is configured for communicating said digital data to a data processor.

10 14. The vibration monitoring probe of Claim 13, wherein at least one of said two or more conductive contacts comprises a circuit common contact.

15 15. The vibration monitoring probe of Claim 14, wherein said vibration monitor additionally comprises a metal probe coupled to a vibration transducer inside said housing, and wherein said circuit common contact is provided by said metal probe.

16. A handheld probe for monitoring the condition of machines, said handheld probe comprising:

a housing;

20 a piezoelectric transducer within said housing; electrical circuitry within said housing comprising a circuit common reference point;

a metal probe mechanically coupled to said piezoelectric transducer and electrically coupled to said circuit common reference point; and

25 a metal contact located proximate to said metal probe, said metal contact coupled to said electrical circuitry so as to transmit electrical signals between said electrical circuitry and one or more devices external to said housing.

30 17. The handheld probe of Claim 16, wherein said metal probe comprises a threaded portion adapted for 1/4 turn engagement with a probe receiving location on the machine.

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10 18. The handheld probe of Claim 17, wherein said threaded portion comprises double start threads.

5 19. An interface between a vibration measuring point on a machine and a digital data processor, said interface comprising:

a portable, handheld housing;

a probe having a first portion external to said housing which is configured to mechanically couple to said vibration measuring point, said probe additionally comprising a second portion coupled to a vibration transducer;

10 a circuit in said housing translating an analog electrical signal output from said transducer into digital data;

communication circuitry within said housing receiving said digital data, and for transmitting said digital data in approximately real time to the digital data processor for further processing.

15 20. The interface of Claim 19, wherein said communication circuitry is configured to transmit data in RS-232 format.

21. The interface of Claim 19, wherein said communication circuitry is coupled to a cable, wherein said cable is removably attached to an input/output port integral to said housing.

20 22. The interface of Claim 19, wherein said communication circuitry comprises a wireless transceiver.

23. A method of monitoring the condition of a machine, the method comprising the steps of:

contacting a measuring point on said machine with a portable probe comprising a vibration transducer;

25 converting an output of said transducer to first data indicative of one or more characteristics of vibrations of said machine; and,

electronically evaluating said data for characteristics associated with a stable data reading.

30 24. The method of Claim 23 wherein said step of electronically evaluating said data comprises the step of determining the rate of change of the value of said data.